Space Weather Forecast

Issued on Sunday 10 November 2024 at 13:12 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate solar activity is likely, with a slight chance of Strong class flares. Chance of G1/Minor Geomagnetic storms 13 Nov.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate during the period, with two Moderate class flares, the largest peaking at 10/0015 UTC. There are seven sunspot regions on the visible disc. One in the southeast is the largest and most complex region. It contains a number of mature spots and has a significant delta configuration in its trailing region. This spot has seen continued growth in penumbra especially around its leading portion, which seems to be the most active part. Another spot resides in the southwest, has mature leading and trailing spots, but has seen some decay in the spots occupying the intermediate region. Another in the northwest is large and mature, though appears stable. The remaining spot regions are smaller and magnetically simple. Low to Moderate activity is forecast to continue, with a likelihood of isolated M-class flares and a slight chance of X-class flares, these most probably from the large spot in the southeast.

No Earth-directed CMEs (Coronal Mass Ejections) were observed.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of ongoing magnetic cloud and perhaps coronal hole high speed stream influences. Wind speeds varied between slightly elevated and background. The Interplanetary Magnetic Field was generally Moderate. The north-south component was mostly southward (negative) directed at Weak to Moderate levels. Resultant Geomagnetic Activity was generally Unsettled to Active (Kp 3-4), with two G1 Minor Storm (Kp 5) intervals 09/1200-1800UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels through the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is forecast, with a likelihood of isolated Moderate class flares and a slight chance of Strong class flares, most probably from the complex sunspot in the east of the disk.

Solar Wind / Geomagnetic Activity: No Earth-directed coronal mass ejections are currently forecast. Slightly Elevated solar wind speeds are considered most likely initially, before the high speed streams from coronal hole 88 has a chance of connecting later Day 1 (10 Nov) or Day 2 (11

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Nov), perhaps bringing Slightly Elevated to briefly Elevated solar wind speeds. Solar wind speeds expected to trend back towards background levels during Day 3 (12 Nov). An increase in solar winds to 450-500 km/s then likely into Day 4 (13 Nov) with an expected connection to some portion of the large coronal hole 90 currently crossing centre-disk.

Generally Quiet to Unsettled (Kp2-3) activity is forecast but with Active (Kp4) intervals likely and a slight chance of peak G1/Minor Storm conditions, between Days 1-3 (10-12 Nov) due to the risk of minor CME and HSS influence. Unsettled to Active (Kp3-4) condition increasingly likely to end the period, with a chance of G1/Minor Storm conditions upon the connection to CH90/+.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is at background levels. There is a rising slight chance of S1/Minor Proton Storms should we see any significant flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	20	20	10	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	60	60	60	60
Very Active	R3-R5 (X Class)	No	20	20	20	20

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	15	20
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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